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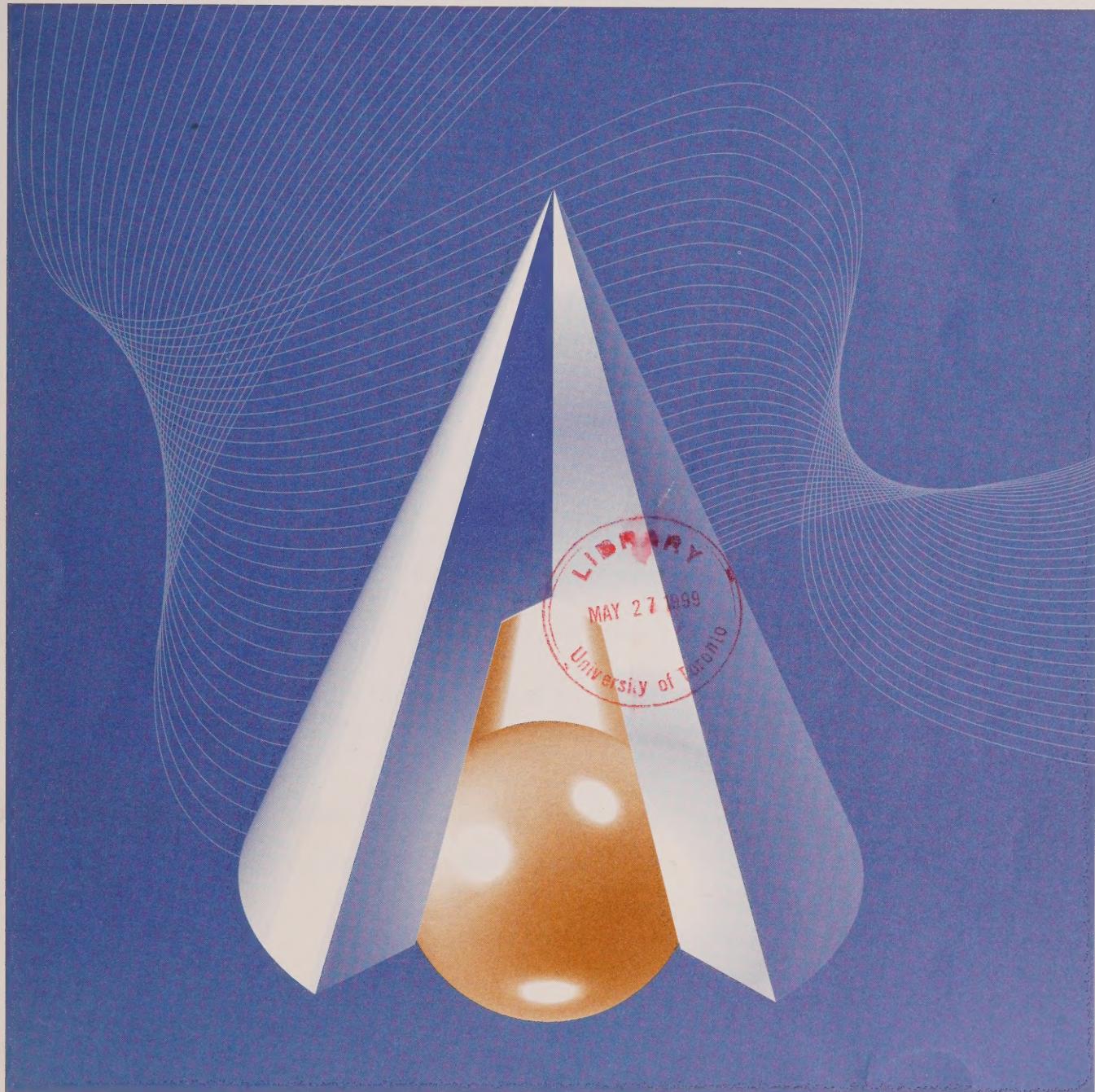
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*The Returns to Education, and the Increasing Wage Gap Between  
Younger and Older Workers*

by C. Kapsalis, R. Morissette and G. Picot

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# **The Returns to Education, and the Increasing Wage Gap Between Younger and Older Workers**

**by C. Kapsalis\*, R. Morissette\*\* and Garnett Picot\*\*\***

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## **ABSTRACT**

Using a regression decomposition approach, we find that, during the 1980s, the growth in the relative educational attainment of older workers has contributed to about one-quarter of the increase in the age-wage gap of men and women. During the 1990s, the age-wage gap increased to a much lesser extent. Changing relative educational attainment accounted for a much greater proportion of the much smaller increase in the gap: almost one-half for males and over three-quarters for women. We also find that, during the 1980s, the expected weekly wages associated with all levels of education fell for younger workers, both for men and women. Older employees, on the other hand, experienced mixed results. Expected weekly wages rose for some older workers and fell for some others.

**Keywords:** Wages; Returns to Education; Earnings Inequality; Young Workers.



## I. Introduction

The decline of real and relative earnings among younger workers, particularly among males under 35, has been well documented, both for Canada (Morissette, Myles and Picot, 1994; Betcherman and Morissette, 1994) and for other industrialized countries (Davis, 1992). This decline has a substantial history, first starting in the late 1970s (Myles, Picot and Wannell, 1988), it has been observed across all educational levels (Beaudry and Green, 1997). Longitudinal studies are suggesting that the earnings decline is persistent in the sense that as a young cohort ages, their age earnings profile remains below that of earlier cohorts (Morissette, 1997; Beaudry and Green, 1997).

Among young women the decline in real earnings has been less noticeable, and declines observed during recessions are usually recaptured during expansions, resulting in little overall structural decline in earnings. However, older women have experienced a much more rapid increase in earnings than their younger counterparts. Thus, while there has been little real decline in earnings among young women, their relative earnings (relative to older female workers) have fallen substantially, as documented in a number of the papers noted above. Hence, the gap in both hourly wages and annual earnings between younger and older workers has increased over the past twenty years for both men and women.

While a number of papers have documented these stylized facts, there has been relatively little work attempting to explain the increasing wage gap by age. Davis (1992) argued that the experience premium associated with older workers may have been increasingly important in a world of rising technological change. Morissette, Myles and Picot (1994) argued that other factors may be at play, including the reluctance of firms to decrease the wages of experienced workers because of the effect on productivity and morale, resulting in the traditional downward stickiness of wages for most workers. There is little empirical evidence to support (or reject) either of these views at this time.

This paper focuses on another possible explanation for the increasing earnings gap between younger and older workers: the changing relative educational attainment levels of younger and older workers. Traditionally younger workers enjoyed an education premium over their older counterparts. While older workers benefited from greater experience, younger workers benefited from higher educational levels. These factors clearly influence relative earnings levels, as experience and education are highly correlated with earnings. In the more recent past however, the relative education premium enjoyed by younger workers has largely disappeared. In the mid-1990s the educational attainment of older workers is roughly comparable to that of their younger counterparts, for males at least. The relative decline in educational attainment among the young over the 1981-1995 period, relative to older workers, would result in a relative decline in earnings.

Using a regression decomposition approach, we find that, during the 1980s, the growth in the relative educational attainment of older workers has contributed to about one-quarter of the increase in the age-wage gap of men and women. During the 1990s, the age-wage gap increased to a much lesser extent. Changing relative educational attainment accounted for a much greater proportion of the much smaller increase in the gap: almost one-half for males and over three-quarters for women.

The second objective of the paper relates to the expected real wages. While the educational attainment of younger male workers has been rising over the 1981-95 period, their real hourly wages and annual earnings have been falling. This suggests that the real expected wages for workers with any given level of education, including a university degree, may have been falling. What of older workers and younger women, has the expected wage associated with any particular level of education been falling? Using a wage equation that controls for changes in other characteristics such as industry of employment, full-time part-time status and region, we find that during the 1980s the expected weekly wages associated with all levels of education fell for younger workers, both for men and women (from 2% to 16%, depending upon education level). Older employees, on the other hand, experienced mixed results. Expected weekly wages rose for some older workers and fell for some others.

The story is somewhat different for the 1990s. Different patterns are observed not so much between younger and older workers but rather between men and women. Young male workers continued to experience a decline in expected wages, regardless of their education level, and older male workers shared in this decline. However, most young women saw their expected wages rise, as did most older women. The only exception was university educated women, who experienced a decline in expected wages during the early 1990s.

## ***II. The Data***

Two sets of data are employed in this research. We use the Survey of Consumer Finances (SCF) to examine weekly earnings over the 1981-95 period. The SCF provides a consistent time series on earnings over this period. Unfortunately, the education variable underwent significant changes in 1989, making results for different educational groups before and after that year not comparable. For this reason, the analysis based on SCF is carried out for two periods: 1981-88 and 1989-1995. These are reasonable time periods, as the former roughly approximates the peak to peak period of the 1980s business cycle. The latter documents changes between the last business cycle peak (1989) and the most recent data, which is well into the 1990s recovery. When we use SCF data, our sample consists of workers with positive weekly earnings and no self-employment income.

We also use the Survey of Work History (SWH) of 1981 and the Labour Market Activity Survey (LMAS) of 1988 to examine both weekly earnings and hourly wages over the 1981-1988 period. Data on hourly wages are not available on a reliable basis from the SCF. The sample selected for these surveys consists of jobs held in December by paid workers.

To keep the comparisons tractable, we restrict our attention to two age groups: individuals aged 25-34 and those aged 45-54. We exclude workers aged 18-24 to sidestep problems associated with shifting patterns over time in the rates of school attendance and part-time employment. Also, at any point in time a significant proportion of 18-24 year olds are still in school, decreasing the proportion who are strongly attached to the labour market, our primary group of interest. Individuals aged 45-54 are selected because changing patterns of early retirements among the 55-64 year old population may also influence the results by changing the composition of the workers in the sample over time.

### III. The Wage Gap Between Younger and Older Workers, 1981-1995

The evolution of wages of individuals aged 25-34 and of those aged 45-54 is shown in Table 1. Whatever wage measure is used and whatever period is considered, all data sets indicate that older men and women improved their position relative to their younger counterparts over the last fifteen years.

The SCF data suggest that the gap in weekly earnings between young and older men rose from 18% to 30% between 1981 and 1988 and continued to grow in the 1990s. The SWH-LMAS data also show an increase in the wage differential, although the magnitude of the increase differs from SCF. According to SWH-LMAS, the wage gap between young and older men—defined both in terms of weekly wages and hourly wages—rose from 4% to 22% between 1981 and 1988.<sup>1</sup>

In 1981, older women earned on average *less* than their younger counterparts. This is likely because a larger proportion of women in the older age bracket worked part-time<sup>2</sup>. The younger cohort also had significantly higher levels of education in 1981 than their older counterparts (Table 2). According to SCF data on weekly earnings, older women earned 7% *less* than young women in 1981 but then earned 5% *more* in 1988. The wage premium grew further in 1995.<sup>3</sup> In contrast, the SWH-LMAS data show that older women earned 7-9% *less* than young women in 1981 and 2-3% *less* in 1988.

The growth of the relative wages of older workers has been associated with a substantial increase in their relative educational attainment. In 1981, 21% of older males and 32% of young males had post-secondary education or more (Table 2). By 1988, the difference had been reduced: the corresponding figures were 30% and 36%. Although the numbers for the 1989-1995 period cannot be compared to those of the 1981-1988 period—for the reasons mentioned above—it is obvious that this pattern continued in the 1990s. In 1989, 40% of older males and 46% of young males had post-secondary education or more: in 1995, the corresponding numbers were 51% and 54%.

A slightly different pattern is observed among women. Between 1981 and 1988, the relative educational attainment—measured by the percentage of women with at least post-secondary education—of older women rose substantially. However, there was little change in the relative educational attainment of the younger and older women between 1989 and 1995.

This declining gap is likely due to the rapid increase in the post-secondary participation rate during the 1960s and early 1970s. While the post-secondary participation rate continued to rise during the 1980s and early 1990s, the increase was not as dramatic as during the 1960s and early

<sup>1</sup> The SWH-LMAS data suggest that most of the increase in the weekly wage gap came from an increase (16%) in the real weekly wages of men aged 45-54. In contrast, the SCF data suggests that the drop in real weekly wages of men aged 25-34 (-7%) is the dominant factor.

<sup>2</sup> In 1981, 29% of women aged 45-54 worked part-time, compared to 22% for women aged 25-34.

<sup>3</sup> In 1995, older women earned 12% more than young females.

1970s. The cohort that was college age in the 1960s received a much higher level of education than their predecessors. As they aged, they raised the educational level of each age group as they passed through it. Upon reaching the 45-54 year old age group, they increased its educational attainment dramatically. Among men, the age disparity in educational levels was almost eliminated, and among women, it was reduced significantly. Continuing education and the receipt of degree and diplomas later in life may also have contributed to this narrowing educational gap.

#### **IV. Decomposition of the Growth in the Wage Gap**

In this section, we seek to determine the extent to which the improvement in the relative educational attainment of older workers accounts for the growth in their relative wages. To do so, we use a regression decomposition technique. This allows us to decompose the *change* in the wage gap between young and older workers into two components: 1) changes in the characteristics of the workers employed in the two age groups and, 2) changes in the expected returns to these characteristics.

Consider the case where the decomposition is applied to the 1981-1988 period. Assume the following wage equation for age group  $j$ :

$$(1) \quad y_{it}^j = X_{it}^j \beta^j + X_{it}^j D_{88} \delta^j + u_{it}^j$$

where  $y_{it}^j$  is the log earnings of the  $i^{th}$  individual of age group  $j$  in year  $t$ ,  $X_{it}^j$  are control variables,  $D_{88}$  is a dummy variable which equals one in 1988, zero otherwise, and  $u_{it}^j$  is a random term. Our controls consist of dummy variables for five education levels, six regions, seven industrial groups and full-time/part-time status. Equation (1) is a conventional wage equation which is fully interacted with a year effect and thus allows the returns to worker characteristics for 1981 and 1988,  $\beta^j$  and  $\beta^j + \delta^j$ , respectively, to vary over time. Using the familiar method of decomposition suggested by Blinder (1973) and Oaxaca (1973), the difference in mean log earnings between 1981 and 1988 for workers of age group  $j$  can be expressed as:

$$(2) \quad \bar{y}_{88}^j - \bar{y}_{81}^j = (\bar{\beta}^j + \bar{\delta}^j)(\bar{X}_{88}^j - \bar{X}_{81}^j) + \bar{X}_{81}^j \bar{\delta}^j$$

The first component on the right of (2) is the part of the growth in earnings of a given age group attributable to changes over time in the mean characteristics of this particular age group. The second component is the part due to differences in the returns to these characteristics as well as differences in the constant terms<sup>4</sup>. Applying (2) to both age groups, the difference between the growth rate of earnings of older workers (r) and the growth rate of earnings of young workers (g) can be expressed as follows:

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<sup>4</sup> The reader familiar with the Oaxaca-Blinder decomposition will have noted that  $\bar{\beta}^j + \bar{\delta}^j = \bar{\beta}_{88}^j$  and that  $\bar{\beta}^j = \bar{\beta}_{81}^j$ .

$$\begin{aligned}
 (3) \quad (\bar{y}_{88}^r - \bar{y}_{81}^r) - (\bar{y}_{88}^g - \bar{y}_{81}^g) &= (\bar{y}_{88}^r - \bar{y}_{88}^g) - (\bar{y}_{81}^r - \bar{y}_{81}^g) = \\
 &((\bar{\beta}' + \bar{\delta}')(\bar{X}_{88}^r - \bar{X}_{81}^r) - (\bar{\beta}^g + \bar{\delta}^g)(\bar{X}_{88}^g - \bar{X}_{81}^g)) \quad + \\
 &(\bar{X}_{81}^r \bar{\delta}' - \bar{X}_{81}^g \bar{\delta}^g)
 \end{aligned}$$

The component on the second line of (3) is the change in the earnings gap due to changes in relative mean characteristics across age groups (i.e. relative changes in the composition of the population), weighted at group-specific 1988 prices. It is this component which allows us to measure the degree to which the growth in the relative educational attainment of older workers accounts for the growth in the age earnings gap. The second component, defined on the third line of (3), is the change due to variation in the relative returns to these characteristics across age groups, weighted by group-specific 1981 means of the explanatory variables.

The decomposition associated with equation (3) is performed for men and women separately and for the two following periods: 1981-1988 and 1989-1995. We first report the results based on SCF data and then follow with the findings obtained from SWH-LMAS.

#### **IV.1 Results Based on SCF Data**

The wage gap between young and older men increased by 0.125 log points between 1981 and 1988 (Table 3). During this period, the growth in the level of education of both young and older males increased the mean (log) weekly earnings by .011 among the young, and .041 among older workers. Thus, the growth in the relative educational attainment of older workers explains 24% (i.e. 0.030/0.125) of the growth in the age-wage gap. Changes in the composition of workers among the other factors (region of employment, industry and full-time/part-time status) had only a marginal effect on the relative wage gap. Changes in the fraction of workers employed part-time decreased the weekly earnings of young males while increasing those of older workers. This factor accounted for 9% of the increase in the wage gap. It may reflect the growing problems young workers face in the labour market. Taken together, compositional changes accounted for 30% of the growth of the wage gap. The remaining 70% is due to changes in the relative returns to characteristics.

Between 1989 and 1995, the age-wage gap grew more moderately (.062) but the changes in the composition of employment by education accounted for a bigger portion of the rise in the gap (45%). This was due to a very rapid increase in the educational attainment of the older workers, which tended to increase their average wages by 5%. A similar pattern, though more moderate, is observed for younger workers. The change in full-time/part-time status played a more significant role during this period, accounting for one-quarter of the wage gap. In this case there was a deterioration among both younger and older workers (i.e. a growing tendency to work part-time in both groups), but much more so among younger workers. Overall, compositional changes in all factors accounted for roughly 75% of the change in the wage gap. Changes in expected returns to specific characteristics accounted for the remaining one-quarter.

The results for women for the 1981-1988 period are very similar to those for men. The age-wage gap virtually increased by the same amount for women (0.126) as it did for men (Table 4). Changes in the distribution of employment by education and changes in the relative propensity to

work part-time accounted for 28% and 11% of the growth in the wage gap, respectively. Globally, compositional changes accounted for 39% of the rising gap.

Likewise, the increase in the age-wage gap among women was much smaller between 1989 and 1995 (0.034). Changes in relative educational attainment account for 87% of the rising gap during this period. This is a little misleading, as compositional effects account altogether for more than the total increase in the wage gap. This is so simply because the expected relative returns to the characteristics considered in our wage equation changed such as to favour younger, not older women. Other things equal, this tended to reduce—rather than increase—the wage gap.

## **IV.2 Results Based on SWH-LMAS**

The results for the 1980s were replicated using data on both hourly and weekly wages from the 1981 Survey of Work History, and the 1988 Labour Market Activity Survey. The wage gap by age increases for both men and women, but more for the former than latter (Table 5). The changing relative educational composition of younger and older workers accounts for from 21% to 23% of the rising wage gap for both men and women, whether using hourly or weekly wages. These are similar to the values reported above. Not surprisingly, the shift in relative part-time/full-time (ft/pt) status plays a larger role when the gap is described in terms of weekly, rather than hourly wages. Changes in relative hours worked per week are more likely to play a role in changing relative weekly wages than relative hourly wages.

Changes in the relative importance of part-time jobs accounted for 9% of the rising weekly wage gap for males, and 38% for women. This latter result is significantly stronger than that observed in the SCF data for women. Finally, shifts in changes in relative industry of employment are also seen to be significant in accounting for the rising weekly wage gap for women in these data (accounting for 33% of the increase). This was not the case in the SCF-based results for the 1980s, where industry shifts were seen to be insignificant.

Depending on the data sets and wage measures used, the growth in the relative educational attainment of older men and women accounts for 21% to 28% of the growth in the age-wage gap observed during the 1981-1988 period (Table 6). For men, SCF and SWH-LMAS suggest that compositional effects explain 24%-35% of the increase in the wage gap during this period. The relative importance of such effects is less clear for women: changes in the composition of employment accounts for about one-quarter of the rising weekly wage gap based on the SCF data, and 91% based on the SWH/LMAS data. The latter results stems from the increased importance of relative shifts in industry and ft/pt status in the special survey data.

## **V. Expected Wages Across All Educational Levels**

So far, the focus of the paper has been on changes in *relative* wages between young and older workers, and the extent to which these changes can be accounted for by changes in relative levels of education, or changes in relative returns to worker or job characteristics. In this section, we ask whether the expected wage for any given level of education has changed over the 1980s and early 1990s. If so, have similar changes occurred for both younger and older workers?

Table 7 presents real weekly earnings for the 1981-1995 period. Two points are worth noting. First, young men saw their real weekly earnings drop 14% during this period while real weekly earnings of older men have remained essentially unchanged. Second, since the educational attainment of both age groups has risen substantially during this period, the stagnation or decrease of average weekly earnings implies that real weekly earnings *must* have fallen within most education levels. This is indeed what happens. Between 1989 and 1995, real weekly earnings fell in all education levels for both young and older men. More importantly, young male university graduates faced a dramatic drop in their weekly wages (-19%) during this period, as did young men with other levels of education (e.g. some-post secondary, -10%; high school graduates, -9%).

The story is different for women. Real weekly earnings of young women changed very little between 1981 and 1995 while those of their older counterparts rose 22%. Contrary to their male counterparts, young female university graduates faced only a slight decrease in their weekly earnings (-3%) between 1989 and 1995.

The expected wages are calculated from equation (1). For each age group, the composition of employment by industry, region and full-time/part-time status is held fixed at the level of the base year (i.e. 1981 for the 1981-88 period, and 1989 for the 1989-95 period). The expected wages are obtained by applying the regression coefficients for the year of interest (e.g. 1981 or 1989) to the values of the controls for industry, region and full-time/part-time status for the base year. For instance, the expected earnings of individuals in age group  $j$  who have an education level  $k$  can be expressed as:

$$(4) \bar{y}_{81}^{jk} = \bar{\alpha}_{81}^j \bar{x}_{81}^j + \bar{\theta}_{81}^{jk} ED_{81}^{jk}$$

$$(5) \bar{y}_{88}^{jk*} = \bar{\alpha}_{88}^j \bar{x}_{81}^j + \bar{\theta}_{88}^{jk} ED_{88}^{jk}$$

Where  $\bar{x}_{81}^j$  is the vector of mean values of the dummy variables for industry, region, and full-time/part-time status for 1981,  $\bar{\alpha}_{81}^j$  and  $\bar{\alpha}_{88}^j$  are the vectors of associated coefficients for the years 1981 and 1988, respectively,  $ED_{81}^{jk}$  and  $ED_{88}^{jk}$  are dummy variables which equal one if the individual has education level  $k$  in 1981 and 1988, respectively, and  $\bar{\theta}_{81}^{jk}$  and  $\bar{\theta}_{88}^{jk}$  are the coefficients associated with these two dummy variables. The expected wages are computed for each of the five educational levels, with the proportion of workers in the region, industry and ft/pt levels in 1981 employed as the  $x$  values. Equations 4-5 indicate that changes in expected wages,  $\bar{y}_{88}^{jk*} - \bar{y}_{81}^{jk}$ , will capture changes in the returns to education as well as changes in the returns to other characteristics. The exponential of the log wage is taken to convert it to wage levels.

## V.1 Results for Men

The expected wages of young men dropped during both periods, and for all levels of educational attainment. Having a higher level of education did not protect young males from getting lower wages. This is consistent with the findings of Beaudry and Green (1997). During the 1980s the decline in weekly earnings was between 7% and 16%, depending upon the level of education

(Table 8). There was no consistent trend by level of education. During the first half of the 1990s the drop was from 1% to 16%. For both periods, the largest decline occurred both among university graduates and individuals with elementary schooling. Thus, the decline was not necessarily smaller for highly educated workers.

Older males also saw their expected weekly earnings fall across all levels of education during the early 1990s. The magnitude of the decline was roughly comparable to that for younger male workers: it ranged from 0.2% to 16%, depending upon the education level. In fact, the decline of wages of all older men with at least grade 9 is not statistically different from that of older men with less than grade 9 (11%). During the 1980s, there was not a consistent decline among all levels of education.

In sum, younger and older male workers were hit equally hard during the 1990s, but older workers (with a given level of education) did not experience the magnitude of the decline of younger workers during the 1980s.

## **V.2 Results for Women**

The results for women are somewhat different. Young women saw their weekly earnings fall across all levels of education during the 1980s: the drop varied between 2% and 9% (Table 9).<sup>5</sup> The decline was not as great as among young men, however. During the first half of the 1990s, weekly earnings of young women rose in almost all educational levels, contrary to those of young males. The only exception is with young female university graduates, whose expected weekly earnings fell slightly.

Older women witnessed an increase in weekly wages in many education levels, especially during the 1990s (Table 9). During the 1980s, their wage growth was not monotonically increasing with education. During the 1990s, only older women with a university degree experienced a significant decline in expected earnings; those fell by 16%.

The overall results are as follows. Young men in all educational levels experienced a decline in expected weekly earnings during both periods. Older men experienced a decline in the 1990s in particular. Young women in all educational levels experienced a decline in the 1980s, but this decline was less substantial than for their male counterparts. During the 1990s, most young and older women saw their expected weekly earnings rise. University graduates were the exception: both young and older women with a university degree saw their expected real weekly earnings fall in the 1990s. In general, women experienced smaller declines or more substantial increases than their male counterparts. It is important to recognize that the results are based on weekly earnings, and these can be influenced by both changes in hourly wages and weekly hours worked. There have been significant changes in weekly hours worked over both the 1980s and early 1990s, particularly among women (Sheridan, Diverty and Sunter, 1996).

<sup>5</sup> The decline in wages of young women with more than elementary schooling is not statistically different (at the 5% level) from that of young women with only elementary schooling.

## VI. Conclusion

This paper has shown that differences in the growth of educational attainment explain one fourth to one third of the growth in the wage gap between young and older workers. The second main finding of this paper is that, whatever data sets are used, substantial drops in real wages took place among young male workers in virtually all education levels.

In a supply and demand framework, the decline in youth real wages *must* originate from a combination of increases in their relative labour supply and/or decreases in their relative labour demand. Davis (1992) suggested that since the decline in youth real wages took place in several countries with divergent labour market institutions, the cause of the decline should lie with a common factor such as skill-biased technological change. Since then, while numerous studies have attempted to explain the growth in the college-high school wage premium (Allen, 1996; Bartel and Sicherman, 1997; Autor, Katz and Krueger, 1997) in the United States, little has been learned about the factors which caused the age-wage gap to widen.

Two pieces of evidence cast doubt on skill-biased technological change as an explanation for the decline of youth real wages. First, industry-specific measures of technological change show no correlation with changes in the returns to experience in the United States (Allen, 1996). Second, in Canada, the decline in youth real wages is associated with a downward shift of the age-earnings profiles of the recent cohorts of young workers (Beaudry and Green, 1997; Morissette, 1997). In these last two studies, there is no evidence that the returns to experience of specific cohorts have increased, as the skill-biased technical change hypothesis would imply. Rather, the growth of the age-wage gap appears to result from a deterioration of the earnings prospects of recent cohorts.

What factors other than skill-biased technical change can then explain the worldwide drop in young workers' real wages? One obvious candidate is the growth in female labour force participation. As long as it is observed in many OECD countries and as long as new female entrants are substitutes for inexperienced workers, the growth of women's labour force participation could induce downward pressures on the real wages of young workers. A second explanation, which may prove difficult to test, relies on self-selection effects. In many OECD countries, there has been a substantial increase in school enrollment. If the growth in school enrollment takes place in a non-random way and, more precisely, if young individuals who choose to stay longer in school have more abilities than those who are observed in the labour market, then self-selection of better individuals into school may explain part of the drop in youth real wages. To the extent that real wages fell among individuals aged 25-29—for which the aforementioned self-selection process is less pronounced—as well as among individuals aged 15-24, it is not clear, *a priori*, how far one can go with the self-selection explanation.

Other explanations will have to rely on labour market institutions of various countries. In Canada, while the aggregate unionization rate has remained fairly stable over the last fifteen years, the unionization rate of young workers has dropped substantially. Yet most of the drop in youth real wages remains even after accounting for this decline in unionization (Morissette, 1997). However, this does not necessarily rule out de-unionization as a potential factor. Combined with a relatively slack Canadian labour market, the decline in unionization may have induced spillover effects, i.e. may have decreased the bargaining power of young workers in

unionized as well as non-unionized sectors. Simple standardization procedures cannot take that possibility into account. Because of the tremendous implications it holds for the potential standard of living of the “future adult” Canadian workforce, the widening of the age-wage gap is likely to remain on the research agenda for the near future.

Table 1: Changes in the Wage Gap Between 25-34 and 45-54 Year Old Workers

		1981	1988	Percent Change 81-88	1989	1995	Percent Change 89-95	Percent Change 81-95
<b>Males</b>			Average Wages; \$1995					
	<b>Hourly (SWH, LMAS)</b>							
	25-34	17.25	16.88	-2.1%				
	45-54	18.01	20.62	14.5%				
	Age Premium; (% difference between age groups)	4.4%	22.2%	17.8%				
	<b>Weekly (SWH, LMAS)</b>							
	25-34	699	694	-0.7%				
	45-54	731	846	15.7%				
	Age Premium	4.6%	21.9%	17.3%				
	<b>Weekly (SCF)</b>							
	25-34	738	684	-7.3%	682	633	-7.2%	-14.2%
	45-54	870	888	2.1%	890	877	-1.5%	0.8%
	Age Premium	17.9%	29.8%	11.9%	30.5%	38.5%	8.0%	20.7%
<b>Females</b>								
	<b>Hourly (SWH, LMAS)</b>							
	25-34	13.88	14.00	0.9%				
	45-54	12.93	13.77	6.5%				
	Age Premium; (% difference between age groups)	-6.8%	-1.6%	5.2%				
	<b>Weekly (SWH, LMAS)</b>							
	25-34	469	474	1.1%				
	45-54	429	458	6.8%				
	Age Premium	-8.5%	-3.4%	5.2%				
	<b>Weekly (SCF)</b>							
	25-34	474	467	-1.5%	456	479	5.0%	1.1%
	45-54	439	490	11.6%	488	536	9.8%	22.1%
	Age Premium	-7.4%	4.9%	12.3%	7.0%	11.9%	4.9%	19.3%

**Table 2: Percentage Distribution of Employees by Level of Education (Based on SCF)**

	1981	1988	1989	1995
<b>Males</b>				
<b>25-34</b>				
None/Elementary	7.0	4.2	3.5	2.4
Some/Completed High	49.9	48.5	39.9	35.1
Some Post-Secondary	10.7	11.6	10.4	8.4
Post-Secondary Diploma	16.0	19.4	30.9	32.0
University Degree	16.4	16.4	15.1	22.2
<b>45-54</b>				
None/Elementary	28.6	19.5	15.9	10.4
Some/Completed High	45.1	44.2	37.8	32.8
Some Post-Secondary	5.6	6.8	6.3	6.0
Post-Secondary Diploma	8.8	12.5	24.7	28.2
University Degree	11.8	17.0	15.3	22.5
Age Educational Gap				
Young-Old with PS Degree Diploma	11.8	6.3	6.0	3.5
<b>Females</b>				
<b>25-34</b>				
None/Elementary	5.1	2.9	2.2	1.4
Some/Completed High	48.3	46.7	40.9	30.1
Some Post-Secondary	10.4	11.0	9.7	8.4
Post-Secondary Diploma	19.6	21.8	31.3	34.8
University Degree	16.6	17.6	15.9	25.3
<b>45-54</b>				
None/Elementary	22.0	15.1	13.1	7.4
Some/Completed High	52.0	49.6	43.9	38.4
Some Post-Secondary	5.8	6.3	7.5	6.5
Post-Secondary Diploma	13.3	16.0	26.0	28.5
University Degree	6.9	13.0	9.5	19.2
Age Educational Gap				
Young-Old with PS Degree Diploma	16.0	10.4	11.7	12.4

Table 3: Results of Decomposition Males: Based on Weekly Wages (SCF)

1981-88	<i>ln</i> Weekly Wages				
	25-34	45-54	Wage gap (difference)		
In 1981	6.4803	6.6304	0.1501		
In 1988	6.3730	6.6481	0.2751		
Change in <i>ln</i> weekly wages	-0.1073	+0.0176	0.1250**		
<b>Change in Wage Gap Due to Change in Composition of Workers By:</b>					
	Education	Region	Industry	FT/PT	Total
25-34	0.0112	-0.0015	-0.0058	-0.0070	-0.0032
45-54	0.0412	-0.0001	-0.0107	0.0037	0.0341
<b>Difference:</b>	<b>0.0301</b>	<b>0.0014</b>	<b>-0.0049</b>	<b>0.0107</b>	<b>0.0373*</b>
<b>As % change in wage gap (0.1250)</b>	<b>24.1%</b>	<b>1.2%</b>	<b>-3.9%</b>	<b>8.6%</b>	<b>29.8%</b>
Change in wage gap due to change in $\beta$ 's (i.e. change in association between characteristics and earnings)					70.2%
1989-95	<i>ln</i> Weekly Wages				
	25-34	45-54	Wage gap (difference)		
In 1989	6.3725	6.6435	0.2710		
In 1995	6.2682	6.6012	0.3330		
Change in <i>ln</i> weekly wages	-0.1043	-0.0423	0.0620**		
<b>Change in Wage Gap Due to Change in Composition of Workers By:</b>					
	Education	Region	Industry	FT/PT	Total
25-34	0.0225	-0.0011	-0.0101	-0.0267	-0.0131
45-54	0.0506	-0.0001	-0.0047	0.0115	0.0343
<b>Difference:</b>	<b>0.0281</b>	<b>-0.0012</b>	<b>-0.0054</b>	<b>0.0152</b>	<b>0.0474*</b>
<b>As % change in wage gap (0.0620)</b>	<b>45.3%</b>	<b>-1.9%</b>	<b>8.6%</b>	<b>24.4%</b>	<b>76.4%</b>
Change in wage gap due to change in $\beta$ 's (i.e. change in association between characteristics and earnings)					23.6%

\* This is the value of the term on the second line of equation (3).

\*\* This is the value of the term on the first line of equation (3).

Table 4: Results of Decomposition Females: Based on Weekly Wages (SCF)

1981-88		ln Weekly Wages			
In 1981 In 1988 Change in ln weekly wages	25-34	45-54	Wage gap (difference)		
	5.9405	5.8294	0.1111		
	5.9297	5.9443	0.0146		
	-0.0108	+0.1149	0.1257**		
Change in Wage Gap Due to Change in Composition of Workers By:					
25-34 45-54 Difference: As % of change in wage gap (0.1257)	Education	Region	Industry	FT/PT	Total
	0.0156	-0.0009	-0.0003	-0.0155	-0.0305
	0.0508	-0.0002	-0.0005	0.0292	0.0794
	0.0353	0.0007	-0.0008	0.0137	-0.0489*
Change in wage gap due to change in $\beta$ 's (i.e. change in association between characteristics and earnings)					
61.1%					
1989-95					
In 1989 In 1995 Change in ln weekly wages	25-34	45-54	Wage gap (difference)		
	5.9140	5.9633	0.0493		
	5.9623	6.0455	0.0832		
	0.0483	-0.0822	0.0339**		
Change in Wage Gap Due to Change in Composition of Workers By:					
25-34 45-54 Difference: As % of change in wage gap (0.0339)	Education	Region	Industry	FT/PT	Total
	0.0493	0.0022	-0.0042	-0.0208	0.0264
	0.0789	-0.0009	0.0057	-0.0071	0.0766
	0.0296	-0.0030	0.0099	0.0137	0.0502*
Change in wage gap due to change in $\beta$ 's (i.e. change in association between characteristics and earnings)					
-48.2%					
* This is the value of the term on the second line of equation (3).					
** This is the value of the term on the first line of equation (3).					

Table 5: Results of the Decomposition Based on Data from the 1981 SWH and the 1989 LMAS

Based on Hourly Wages		Males		Females	
Change in $\ln$ hourly wages, 1981-88 (i.e. wage gap)	0.1653		0.0537		
Change in wage gap due to change in composition by:					
Education	0.0348	(21.1%)	0.0114	(21.2%)	
Region	0.0008	(0.5%)	0.0005	(0.9%)	
Industry	0.0033	(2.0%)	0.0194	(36.0%)	
FT/PT	0.0004	(0.3%)	0.0014	(2.7%)	
All factors	0.0393	(23.8%)	0.0327	(60.8%)	
Change in wage gap due to change in $\beta$ 's*	0.1260	(76.2%)	0.0210	(39.2%)	
Based on Weekly Wages		Males		Females	
Change in $\ln$ weekly wages, 1981-88 (i.e. wage gap)	0.1693		0.0583		
Change in wage gap due to change in composition by:					
Education	0.0387	(22.9%)	0.0129	(22.2%)	
Region	-0.0002	(-0.1%)	-0.0012	(-2.1%)	
Industry	0.0048	(2.9%)	0.0193	(33.1%)	
FT/PT	0.0156	(9.2%)	0.0222	(38.1%)	
All factors	0.0589	(34.8%)	0.0532	(91.3%)	
Change in wage gap due to change in $\beta$ 's*	0.1104	(65.2%)	0.0051	(8.7%)	

Table 6: Change in the Wage Gap Between 25-34 and 45-54 Year Olds Due to the Changing Composition by Educational Attainment

	1981-88	1989-95
<b>Males</b>		
Weekly wages, SCF	24.1%	45.3%
Weekly wages, SWH/LMAS	22.9%	---
Hourly wages, SWH/LMAS	21.1%	---
<b>Females</b>		
Weekly wages, SCF	28.0%	87.4%
Weekly wages, SWH/LMAS	22.2%	---
Weekly wages, SWH/LMAS	21.2%	---

Table 7: Weekly Wages (\$1995) by Education Level

Educational attainment	Men					
	25-34 Year Olds			45-54 Year Olds		
	1981	1988	% Change	1981	1988	% Change
Elementary	591	543	-8.1%	723	699	-3.3%
Some/completed high school	705	653	-7.4%	837	821	-2.0%
Some post-school	726	700	-3.5%	952	992	4.2%
Post-secondary diploma	790	725	-8.2%	903	990	9.7%
University degree	856	752	-12.2%	1285	1162	-9.6%
<hr/>						
Educational attainment	25-34 Year Olds					
	1989	1995	% Change	1989	1995	% Change
	571	468	-18.0%	705	604	-14.2%
<Grade 9	606	584	-3.7%	752	709	-5.7%
Grades 9-10	628	579	-7.9%	791	750	-5.3%
Grades 11-13 (not graduated)	652	594	-8.8%	894	840	-6.0%
Grades 11-13 (graduated)	643	577	-10.1%	961	872	-9.2%
Some post-secondary	693	680	-1.8%	875	855	-2.2%
Post-secondary diploma	834	671	-19.4%	1245	1170	-6.1%
<hr/>						
Women						
Educational attainment	25-34 Year Olds			45-54 Year Olds		
	1981	1988	% Change	1981	1988	% Change
	319	309	-3.0%	357	340	-4.7%
Elementary	420	415	-1.2%	406	434	6.7%
Some/completed high school	494	459	-7.2%	491	499	1.5%
Some post-school	502	488	-2.8%	510	513	0.7%
Post-secondary diploma	630	609	-3.4%	762	849	11.4%
<hr/>						
Educational attainment	25-34 Years Olds			45-54 Year Olds		
	1989	1995	% Change	1989	1995	% Change
	296	352	18.7%	357	367	2.6%
<Grade 9	322	342	6.3%	376	355	-5.5%
Grades 9-10	351	323	-7.9%	383	446	16.3%
Grades 11-13 (not graduated)	422	423	0.3%	473	481	1.7%
Grades 11-13 (graduated)	411	419	1.9%	507	536	5.7%
Some post-secondary	473	471	-0.5%	527	535	1.4%
Post-secondary diploma	632	613	-2.9%	831	781	-6.0%

Table 8: Change in Expected Weekly Wage by Level of Education; Holding the Composition by Region, Industry and FT/PT Status Fixed, Males

Change in Expected Wage 1981-88, in 1981 Dollars						
	25-34 Year Olds			45-54 Year Olds		
	1981	1988	% Change	1981	1988	% Change
<b>Educational attainment*</b>						
Elementary	500	419	-16.2% -	637	602	-5.5% -
Some/completed high school	618	570	-7.8% *	740	725	-2.0% ns
Some post-school	651	606	-6.9% *	841	875	+4.0% ns
Post-secondary diploma	707	627	-11.3% ns	791	849	+7.3% *
University degree	797	682	-14.4% ns	1164	1126	-3.2% ns
Change in Expected Wage, 1989-95, in 1989 Dollars						
	25-34 Year Olds			45-54 Year Olds		
	1989	1995	% Change	1989	1995	% Change
<b>Educational attainment*</b>						
<Grade 9	472	390	-17.4% -	611	551	-10.9% -
Grades 9-10	511	507	-0.8% *	638	622	-2.5% ns
Grades 11-13 (not graduated)	550	513	-6.7% ns	690	688	-0.2% ns
Grades 11-13 (graduated)	557	525	-5.7% *	777	728	-6.3% ns
Some post-secondary	570	522	-8.4% ns	832	709	-14.8% ns
Post-secondary diploma	607	583	-3.9% *	756	752	-0.5% *
University degree	709	593	-16.4% ns	1186	991	-16.4% ns

- The educational attainment levels, and hence the expected weekly wages by educational levels, are not comparable between the two time periods.
  - \* Statistically different from the lowest education level.
- ns: Not different from the lowest education level.

Table 9: Change in Expected Weekly Wage by Level of Education; Holding the Composition by Region, Industry and FT/PT Status Fixed, Females

Change in Expected Wage 1981-88, in 1981 Dollars						
	25-34 Year Olds			45-54 Year Olds		
	1981	1988	% Change	1981	1988	% Change
<b>Educational attainment*</b>						
Elementary	268	243	-9.3% -	279	265	-5.0% -
Some/completed high school	336	325	-3.3% ns	328	346	+5.5% *
Some primary school	385	362	-6.0% ns	381	404	+6.0% ns
Post-secondary diploma	427	418	-2.1% ns	398	400	+0.5% ns
University degree	525	488	-7.0% ns	569	637	+12.0% *
Change in Expected Wage, 1989-95, in 1989 Dollars						
	25-34 Year Olds			45-54 Year Olds		
	1989	1995	% Change	1989	1995	% Change
<b>Educational attainment*</b>						
<Grade 9	244	283	+15.9% -	308	327	+6.2% -
Grades 9-10	293	310	+5.8% ns	319	354	+10.9% ns
Grades 11-13 (not graduated)	302	300	-0.7% ns	334	384	+14.9% ns
Grades 11-13 (graduated)	350	364	+4.0% ns	383	393	+2.63% ns
Some post-secondary	343	352	+2.6% ns	404	400	-1.0% ns
Post-secondary diploma	386	402	+4.1% ns	424	433	+2.1% ns
University degree	502	486	-3.2% *	646	554	-15.7% *

- The educational attainment levels, and hence the expected weekly wages by educational levels, are not comparable between the two time periods.
  - \* Statistically different from the lowest education level.
- ns: Not different from the lowest education level.

## Appendix Tables

Appendix Table 1: Regression Results: For Males, 1981-88, Dependant Variable:  $\ln$  Weekly Wages (SCF)

Variable	25-34 Age Group					45-54 Age Group						
	Coefficient		Values		$\beta_{81}$	$\beta_{88}$	Coefficient		Values			
	198	198	1	8			198	198	1	8		
Constant	5.69	0.062	---	---	5.69	5.43	5.755	0.081	---	---	5.755	5.414
Some/completed high school	0.210	0.028	49.9	48.5	0.210	0.308	0.149	0.022	45.1	44.2	0.149	0.186
Some post-secondary	0.263	0.034	10.7	11.6	0.263	0.369	0.277	0.043	5.6	6.8	0.277	0.374
Post-secondary diploma	0.346	0.032	16.0	19.4	0.346	0.404	0.215	0.036	8.8	12.5	0.215	0.343
University degree	0.466	0.033	16.4	16.4	0.466	0.488	0.602	0.034	11.8	17	0.602	0.626
Quebec	0.088	0.028	27.3	26.8	0.088	0.028	0.143	0.038	27.2	27.5	0.143	0.074
Ontario	0.116	0.027	35.0	37.9	0.117	0.146	0.165	0.037	38.9	37.5	0.165	0.188
Manitoba/Saskatchewan	0.077	0.037	6.4	6.3	0.077	0.039	0.144	0.051	5.9	5.7	0.144	0.048
Alberta	0.217	0.032	10.9	9.8	0.217	0.153	0.234	0.047	8.3	8.3	0.234	0.051
British Columbia	0.225	0.032	12.0	11.1	0.225	0.152	0.207	0.043	12.1	13.1	0.207	0.15
Construction	0.017	0.037	9.3	10.0	0.017	-0.145	0.002	0.049	10.5	9	0.002	-0.078
Manufacturing	-0.065	0.033	26.3	25.7	-0.065	-0.133	-0.022	0.044	29	24.4	-0.022	-0.002
Transport/communication	-0.026	0.034	19.4	17.1	-0.026	-0.119	0.024	0.046	18.7	17.4	0.024	-0.011
Business service	-0.182	0.041	6.2	6.8	-0.182	-0.326	-0.080	0.061	4.2	5.4	-0.08	-0.272
Personal service	-0.237	0.033	25.3	27.7	-0.237	-0.317	-0.220	0.045	23.5	28.2	-0.22	-0.263
Public service	0.032	0.039	7.9	7.4	0.032	-0.061	-0.011	0.051	8.8	9.6	-0.011	-0.036
Full-time	0.500	0.046	97.6	96.2	0.500	0.700	0.617	0.064	97.8	98.4	0.617	0.977
$t_{88}$	-0.261	0.083	---	---	---	---	-0.341	0.117	---	---	---	---
$t_{88}$ : Some/completed high school	0.097	0.044	---	---	---	---	0.036	0.033	---	---	---	---
$t_{88}$ : Some post-secondary	0.106	0.051	---	---	---	---	0.096	0.059	---	---	---	---
$t_{88}$ : Post-secondary diploma	0.058	0.048	---	---	---	---	0.128	0.049	---	---	---	---
$t_{88}$ : University degree	0.022	0.049	---	---	---	---	0.024	0.046	---	---	---	---
$t_{88}$ : Quebec	-0.059	0.038	---	---	---	---	-0.069	0.052	---	---	---	---
$t_{88}$ : Ontario	0.029	0.037	---	---	---	---	0.023	0.051	---	---	---	---
$t_{88}$ : Manitoba/Saskatchewan	-0.038	0.051	---	---	---	---	-0.955	0.071	---	---	---	---
$t_{88}$ : Alberta	-0.064	0.045	---	---	---	---	-0.183	0.065	---	---	---	---
$t_{88}$ : British Columbia	-0.073	0.044	---	---	---	---	-0.057	0.059	---	---	---	---
$t_{88}$ : Construction	-0.162	0.052	---	---	---	---	-0.080	0.068	---	---	---	---
$t_{88}$ : Manufacturing	-0.068	0.046	---	---	---	---	0.020	0.061	---	---	---	---
$t_{88}$ : Transport/communication	-0.093	0.047	---	---	---	---	-0.034	0.063	---	---	---	---
$t_{88}$ : Business Service	-0.144	0.057	---	---	---	---	-0.192	0.081	---	---	---	---
$t_{88}$ : Personal Service	-0.080	0.046	---	---	---	---	-0.042	0.061	---	---	---	---
$t_{88}$ : Public Service	-0.094	0.055	---	---	---	---	-0.025	0.069	---	---	---	---
$t_{88}$ : FT	0.201	0.057	---	---	---	---	0.359	0.097	---	---	---	---
# Observations = 13640						# Observations = 6344						
F= 53.4						F= 40.3						
ADJ.R <sup>2</sup> = 0.11						ADJ.R <sup>2</sup> = 1.6						

Appendix Table 2: Regression Results: For Males, 1989-95, Dependent Variable:  $\ln$  Weekly Wages (SCF)

Variable	25-34 Age Group						45-54 Age Group					
	Coefficient		Values		$\beta_{81}$	$\beta_{88}$	Coefficient		Values		$\beta_{81}$	$\beta_{88}$
			198 9	199 5					198 9	199 5		
Constant	5.588	0.063	---	---	5.588	5.140	5.878	0.090	---	---	5.878	5.521
Grade 9-10	0.079	0.045	9.9	7	0.079	0.262	0.044	0.036	15.4	11	0.044	0.121
Grade 11-13 no diploma	0.153	0.048	7.2	6.2	0.153	0.273	0.123	0.052	4.8	5.1	0.123	0.221
Grade 11-13 diploma	0.166	0.042	22.8	21.9	0.166	0.296	0.241	0.035	17.6	16.7	0.241	0.278
Some post-secondary	0.189	0.045	10.4	8.4	0.189	0.290	0.310	0.048	6.3	6	0.310	0.252
Post-secondary diploma	0.251	0.041	30.9	32	0.251	0.400	0.213	0.033	24.7	28.2	0.213	0.311
University degree	0.406	0.044	15.1	22.2	0.406	0.419	0.664	0.039	15.3	22.5	0.664	0.587
Quebec	0.107	0.030	27.1	24.3	0.107	0.111	0.133	0.040	27.7	27.3	0.133	-0.010
Ontario	0.130	0.029	37.5	39.1	0.130	0.172	0.166	0.039	37.7	37.6	0.166	0.076
Manitoba/Saskatchewan	0.031	0.039	6.3	6.1	0.031	0.058	0.067	0.054	5.7	5.7	0.067	-0.013
Alberta	0.916	0.035	10	9.9	0.092	0.149	0.123	0.049	8.3	8.4	0.123	-0.043
British Columbia	0.155	0.034	11.3	12.7	0.155	0.208	0.016	0.045	12.4	12.7	0.160	0.107
Manufacturing durables	-0.027	0.039	9.7	9.4	-0.027	-0.090	-0.066	0.055	8.8	9.7	-0.066	-0.114
Manufacturing non durables	-0.100	0.038	13.5	12.9	-0.100	-0.079	0.003	0.051	14.7	13.6	0.003	-0.026
Construction	-0.940	0.038	11.7	10.1	-0.094	-0.085	-0.049	0.054	9.8	8.3	-0.049	-0.134
Transportation/communication	0.004	0.039	10.4	9.3	0.004	-0.037	0.016	0.052	12.4	12.1	0.016	-0.065
Wholesale	-0.112	0.042	7.3	6.5	-0.112	-0.160	-0.055	0.059	6.6	5	-0.055	-0.193
Retail	-0.185	0.038	11.5	10.8	-0.185	-0.313	-0.250	0.057	7.5	7.8	-0.250	-0.252
F.I.R.E.	-0.097	0.051	3.4	3.9	-0.097	-0.010	-0.036	0.066	4.1	4.4	-0.036	-0.030
Communication services	-0.222	0.041	8.4	9.8	-0.222	-0.243	-0.248	0.054	11.6	12.8	-0.248	-0.124
Personal Services	-0.501	0.048	4.2	5.6	-0.501	-0.441	-0.471	0.067	3.8	3.1	-0.471	-0.677
Business Services	-0.161	0.041	7.8	10.2	-0.161	-0.213	-0.252	0.064	4.7	6.8	-0.252	-0.169
Public Administration	-0.057	0.043	6.7	6.6	-0.057	0.003	0.030	0.053	10.7	11.3	0.030	-0.001
Full-time	0.606	0.358	95.5	91.1	0.606	0.866	0.500	0.073	98.1	95.8	0.500	0.890
$t_{88}$	-0.448	0.092	---	---	---	---	-0.358	0.112	---	---	---	---
$t_{88}$ : Grade 9-10	0.183	0.073	---	---	---	---	0.078	0.052	---	---	---	---
$t_{88}$ : Grade 11-13 no diploma	0.121	0.075	---	---	---	---	0.098	0.071	---	---	---	---
$t_{88}$ : Grade 11-13 diploma	0.130	0.067	---	---	---	---	0.037	0.050	---	---	---	---
$t_{88}$ : Some post-secondary	0.101	0.072	---	---	---	---	-0.058	0.067	---	---	---	---
$t_{88}$ : Post-secondary diploma	0.149	0.066	---	---	---	---	0.097	0.046	---	---	---	---
$t_{88}$ : University degree	0.012	0.069	---	---	---	---	-0.077	0.053	---	---	---	---
$t_{88}$ : Quebec	0.004	0.043	---	---	---	---	-0.143	0.053	---	---	---	---
$t_{88}$ : Ontario	0.042	0.042	---	---	---	---	-0.090	0.052	---	---	---	---
$t_{88}$ : Manitoba/Saskatchewan	0.027	0.057	---	---	---	---	-0.079	0.072	---	---	---	---
$t_{88}$ : Alberta	0.057	0.050	---	---	---	---	-0.166	0.065	---	---	---	---
$t_{88}$ : British Columbia	0.053	0.049	---	---	---	---	-0.052	0.060	---	---	---	---
$t_{88}$ : Manufacturing durables	-0.063	0.058	---	---	---	---	-0.048	0.073	---	---	---	---
$t_{88}$ : Manufacturing non durables	0.020	0.056	---	---	---	---	-0.029	0.069	---	---	---	---
$t_{88}$ : Construction	0.009	0.057	---	---	---	---	-0.085	0.073	---	---	---	---
$t_{88}$ : Transport/communication	-0.041	0.058	---	---	---	---	-0.081	0.070	---	---	---	---
$t_{88}$ : Wholesale	-0.048	0.062	---	---	---	---	-0.138	0.081	---	---	---	---
$t_{88}$ : Retail	-0.128	0.057	---	---	---	---	-0.001	0.076	---	---	---	---
$t_{88}$ : F.I.R.E.	0.087	0.073	---	---	---	---	0.007	0.088	---	---	---	---
$t_{88}$ : Communication services	-0.021	0.060	---	---	---	---	0.124	0.072	---	---	---	---
$t_{88}$ : Personal Services	0.059	0.068	---	---	---	---	-0.205	0.092	---	---	---	---
$t_{88}$ : Business Services	-0.052	0.060	---	---	---	---	0.083	0.082	---	---	---	---
$t_{88}$ : Public Administration	0.060	0.063	---	---	---	---	-0.032	0.071	---	---	---	---
$t_{88}$ : FT	0.261	0.045	---	---	---	---	0.390	0.085	---	---	---	---
# Observations = 12337							# Observations = 7426					
F= 53.1							F= 38.7					
ADJ.R <sup>2</sup> = 0.17							ADJ.R <sup>2</sup> = 0.19					

Appendix Table 3: Regression Results: For Females, 1981-88, Dependent Variable: ln Weekly Wages (SCF)

Variable	25-34 Age Group					45-54 Age Group						
	Coefficient		Values		$\beta_{81}$	$\beta_{88}$	Coefficient		Values			
	198	198	1	8			198	198	1	8		
Constant	4.934	0.722	---	---	4.934	4.993	4.765	0.098	---	---	4.7648	5.0147
Some/completed high school	0.226	0.050	48.3	46.7	0.226	0.291	0.163	0.370	52	49.6	0.1633	0.265
Some post-secondary	0.468	0.046	10.4	11	0.365	0.397	0.314	0.068	5.8	6.3	0.314	0.4211
Post-secondary diploma	0.673	0.047	19.6	21.8	0.468	0.540	0.356	0.051	13.3	16	0.356	0.4108
University degree	0.198	0.037	16.6	17.6	0.673	0.696	0.714	0.064	6.9	13	0.7145	0.877
Quebec	0.164	0.035	24.9	25.7	0.198	0.100	0.190	0.062	24.3	24.8	0.19	0.1075
Ontario	0.764	0.046	36.9	37.9	0.164	0.164	0.142	0.060	41.5	40.4	0.1418	0.2018
Manitoba/Saskatchewan	0.222	0.042	7.2	6.9	0.076	0.102	0.173	0.075	8	7	0.173	0.0576
Alberta	0.042	0.041	10.9	9.9	0.222	0.194	0.250	0.074	8.6	8.9	0.2503	0.1151
British Columbia	0.209	0.057	12.1	11.3	0.209	0.172	0.283	0.070	11	11.5	0.2828	0.1201
Manufacturing	0.039	0.060	13.6	13.7	0.039	-0.052	0.267	0.085	15.2	13.8	0.2669	-0.056
Transport/communication	0.172	0.061	8.7	9.3	0.172	0.017	0.277	0.096	6.1	7	0.2766	0.117
Business service	-0.011	0.053	7.8	8.6	-0.011	-0.055	0.111	0.099	5.1	5.9	0.1106	-0.0149
Personal service	-0.028	0.061	59	57	-0.028	-0.134	0.156	0.078	62.4	62.9	0.1555	-0.0749
Public service	0.084	0.022	7.9	8.4	-0.185	0.022	0.335	0.092	7.8	7.1	0.3345	0.1107
Full-time	0.620	0.102	77.7	80.2	0.606	0.584	0.713	0.032	71.1	75.2	0.7132	0.6586
$t_{88}$	0.059	0.065	---	---	---	---	0.250	0.132	---	---	---	---
$t_{88}$ : Some/completed high school	0.065	0.073	---	---	---	---	0.102	0.053	---	---	---	---
$t_{88}$ : Some post-secondary	0.033	0.068	---	---	---	---	0.107	0.091	---	---	---	---
$t_{88}$ : Post-secondary diploma	0.072	0.070	---	---	---	---	0.055	0.069	---	---	---	---
$t_{88}$ : University degree	0.022	0.049	---	---	---	---	0.163	0.080	---	---	---	---
$t_{88}$ : Quebec	-0.098	0.047	---	---	---	---	-0.083	0.081	---	---	---	---
$t_{88}$ : Ontario	-5.271	0.062	---	---	---	---	0.060	0.077	---	---	---	---
$t_{88}$ : Manitoba/Saskatchewan	0.256	0.057	---	---	---	---	-0.115	0.099	---	---	---	---
$t_{88}$ : Alberta	-0.028	0.055	---	---	---	---	-0.135	0.096	---	---	---	---
$t_{88}$ : British Columbia	-0.038	0.077	---	---	---	---	-0.163	0.091	---	---	---	---
$t_{88}$ : Manufacturing	-0.091	0.080	---	---	---	---	-0.323	0.115	---	---	---	---
$t_{88}$ : Transport/communication	-0.155	0.081	---	---	---	---	-0.160	0.127	---	---	---	---
$t_{88}$ : Business Service	-0.044	0.071	---	---	---	---	-0.126	0.131	---	---	---	---
$t_{88}$ : Personal Service	-0.106	0.081	---	---	---	---	-0.230	0.105	---	---	---	---
$t_{88}$ : Public Service	-0.061	0.030	---	---	---	---	-0.224	0.124	---	---	---	---
$t_{88}$ : FT	-0.036	0.072	---	---	---	---	-0.055	0.044	---	---	---	---
# Observations = 11783						# Observations = 5400						
F= 94.4						F= 61.0						
ADJ.R <sup>2</sup> = 0.20						ADJ.R <sup>2</sup> = 0.26						

Appendix Table 4: Regression Results: For Females, 1989-95, Dependent Variable:  $\ln$  Weekly Wages (SCF)

Variable	25-34 Age Group					45-54 Age Group				
	Coefficient		Values		$\beta_{81}$	$\beta_{88}$	Coefficient		Values	
	198 9	199 5					198 9	199 5		
Constant	5.020	0.081	---	---	5.020	5.005	5.069	0.107	---	---
Grade 9-10	0.180	0.061	7.6	4.1	0.180	0.094	0.339	0.048	13.9	8.7
Grade 11-13 no diploma	0.213	0.064	5.5	3.8	0.213	0.060	0.079	0.057	7.6	4.5
Grade 11-13 diploma	0.358	0.056	27.8	22.2	0.358	0.253	0.217	0.044	22.4	25.2
Some post-secondary	0.340	0.060	9.7	8.4	0.340	0.220	0.271	0.058	7.5	6.5
Post-secondary diploma	0.456	0.056	31.3	34.8	0.456	0.352	0.319	0.044	26	28.5
University degree	0.720	0.059	15.9	25.3	0.720	0.542	0.740	0.056	9.5	19.2
Quebec	0.027	0.032	25.9	23.7	0.027	0.200	0.111	0.052	25.3	25.1
Ontario	0.111	0.031	38.5	39.5	0.111	0.264	0.180	0.496	40.2	39.4
Manitoba/Saskatchewan	0.012	0.042	6.6	6.5	0.012	0.074	-4.230	0.065	6.9	6.5
Alberta	0.092	0.038	9.8	9.7	0.092	0.159	0.090	0.062	8.7	8.8
British Columbia	0.102	0.037	11	12.7	0.103	0.335	0.055	0.058	11.7	13
Manufacturing durables	-0.108	0.061	7.6	7.3	-	-	0.117	0.098	8.8	7.7
Manufacturing non durables	0.034	0.066	4.6	3.9	0.034	-	0.202	0.106	4.6	2.4
Construction	-0.193	0.083	1.6	1	-	0.193	-	0.075	0.128	1.7
Transportation/communication	0.106	0.064	5.3	5.3	0.106	0.071	0.328	0.106	4.5	4.5
Wholesale	0.030	0.068	3.6	3.1	0.030	0.003	0.017	0.111	3.4	3
Retail	-0.206	0.059	11.7	11.9	-	-	0.030	0.095	12.3	11.6
F.I.R.E.	-0.028	0.060	9.3	9	-	0.028	0.183	0.100	7.1	7
Communication services	-0.019	0.056	26.2	28	-	0.020	0.111	0.091	32.6	37.5
Personal Services	-0.454	0.059	11.2	11.9	0.454	0.401	-	-0.183	0.096	10.2
Business Services	-0.038	0.060	9.2	10.5	-	0.038	0.127	0.101	6.4	7.8
Public Administration	0.095	0.061	7.4	6.4	0.095	0.074	0.239	0.101	6.4	7.2
Full-time	0.613	0.021	80	76.6	0.613	0.662	0.593	0.030	76.5	75.3
$t_{88}$	-0.015	0.127	---	---	---	---	-0.200	0.141	---	---
$t_{88}$ : Grade 9-10	-0.087	0.102	---	---	---	---	0.045	0.071	---	---
$t_{88}$ : Grade 11-13 no diploma	-0.153	0.105	---	---	---	---	0.082	0.085	---	---
$t_{88}$ : Grade 11-13 diploma	-0.105	0.093	---	---	---	---	-0.034	0.064	---	---
$t_{88}$ : Some post-secondary	-0.119	0.098	---	---	---	---	-0.070	0.082	---	---
$t_{88}$ : Post-secondary diploma	-0.104	0.092	---	---	---	---	-0.038	0.064	---	---
$t_{88}$ : University degree	-0.178	0.094	---	---	---	---	-0.231	0.075	---	---
$t_{88}$ : Quebec	0.173	0.047	---	---	---	---	0.042	0.068	---	---
$t_{88}$ : Ontario	0.154	0.045	---	---	---	---	0.015	0.066	---	---
$t_{88}$ : Manitoba/Saskatchewan	0.061	0.061	---	---	---	---	0.125	0.086	---	---
$t_{88}$ : Alberta	0.067	0.055	---	---	---	---	0.083	0.081	---	---
$t_{88}$ : British Columbia	0.232	0.053	---	---	---	---	0.264	0.076	---	---
$t_{88}$ : Manufacturing durables	-0.017	0.094	---	---	---	---	-0.118	0.129	---	---
$t_{88}$ : Manufacturing non durables	-0.059	0.101	---	---	---	---	0.097	0.146	---	---
$t_{88}$ : Construction	-0.093	0.133	---	---	---	---	0.149	0.181	---	---
$t_{88}$ : Transport/communication	-0.036	0.097	---	---	---	---	-0.057	0.139	---	---
$t_{88}$ : Wholesale	-0.028	0.104	---	---	---	---	-0.056	0.147	---	---
$t_{88}$ : Retail	-0.069	0.090	---	---	---	---	-0.045	0.125	---	---
$t_{88}$ : F.I.R.E.	2.038	0.092	---	---	---	---	-0.058	0.131	---	---
$t_{88}$ : Communication services	-0.006	0.087	---	---	---	---	0.137	0.120	---	---
$t_{88}$ : Personal Services	0.053	0.090	---	---	---	---	-0.033	0.127	---	---
$t_{88}$ : Business Services	-0.057	0.091	---	---	---	---	0.042	0.131	---	---
$t_{88}$ : Public Administration	-0.022	0.094	---	---	---	---	0.033	0.131	---	---
$t_{88}$ : FT	0.049	0.029	---	---	---	---	0.219	0.039	---	---

# Observations = 11327

F= 94.3

ADJ.R<sup>2</sup> = 0.28

# Observations = 6724

F= 61.5

ADJ.R<sup>2</sup> = 0.30

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